

CLAIMS

What is claimed is:

1. A method of halftoning a color image that avoids two and three color moiré, the method comprising the steps of:

selecting a set of screens that have fundamental frequency vectors that combine to yield only moiré frequency vectors of types selected from the group consisting of zero frequency moiré frequency vectors, near zero frequency moiré frequency vectors and high frequency moiré frequency vectors;

associating a first dot screen from the selected set of screens with a first colorant;

10 associating a second dot screen from the selected set of screens with a second colorant;

associating a first line screen from the selected set of screens with a third colorant;

receiving the color image to be halftoned; and,

halftoning the color image with the associated screens.

2. The method of halftoning a color image of claim 1 further comprising the step of:

associating a second line screen from the selected set of screens with a fourth colorant.

3. The method of halftoning a color image of claim 1 wherein the step of: associating a first line screen with a third colorant comprises associating a first hybrid line screen with the third colorant.

4. The method of halftoning a color image of claim 2 wherein the step of: associating a second line screen with a fourth colorant comprises associating a second hybrid line screen with the fourth colorant.

5. The method of halftoning a color image of claim 1 wherein the step of: associating a first line screen with a third colorant comprises associating the first line screen with one of a cyan, magenta, and black colorant.

6. The method of halftoning a color image of claim 1 further comprising the step of: analyzing process effects and wherein the step of selecting a set of screens further comprises:

5 selecting a set of screens having fundamental frequency vectors that combine with fundamental frequency vectors of the analyzed process effects to yield only moiré frequency vectors of types selected from the group consisting of zero moiré frequency vectors, near zero moiré frequency vectors and high frequency moiré frequency vectors.

7. The method of halftoning a color image of claim 1 wherein the step of: associating a first line screen with a third colorant comprises associating the first line screen with a black colorant and the method further comprises:

orienting the first line screen in a direction that neutralizes process effects.

8. The method of halftoning separations of a color image of claim 1 wherein the step of: associating a first line screen with a third colorant comprises associating the first line screen with the lightest colorant of a set of cyan, magenta, and black colorants.

9. The method of halftoning a color image of claim 2 wherein the step of: associating a second line screen with a fourth colorant comprises associating the second line screen with a yellow colorant.

10. The method of halftoning a color image of claim 2 further comprising orienting the screens at angular distances rationally divisible by 30 degrees.

11. The method of halftoning a color image of claim 8 further comprising orienting the first and second line screens 90 degrees apart.

12. The method of halftoning a color image of claim 8 further comprising orienting the first dot screen at 15 degrees.

13. An image processor operative to halftone an image so that the image can be rendered without displeasing moiré patterns, the image processor comprising:

a selected set of halftone screens including a first dot screen, a first line screen, and a third screen, the screens selected and oriented so that fundamental frequency vectors of the screens combine to yield only moiré frequency vectors of types selected from the group consisting of zero frequency moiré frequency vectors, near zero frequency moiré frequency vectors, and high frequency moiré frequency vectors; and,

10 a halftoner operative to associate the first dot screen, the first line screen and the third screen with first, second and third color separations respectively and to use the associated screens to halftone the image by halftoning the respective separations.

14. The image processor of claim 13 wherein the third screen comprises a second dot screen.

15. The image processor of claim 14 wherein the selected set of halftone screens further comprises a second line screen and wherein the halftoner is further operative to associate the second line screen with a fourth respective color separation and to use the associated screens to halftone the image by halftoning the respective separations.

16. The image processor of claim 13 further comprising a print engine operative to render the halftoned image.

17. The image processor of claim 16 wherein the print engine comprises one of a xerographic printer, a lithographic printer and an ink jet printer.

18. The image processor of claim 13 wherein the first line screen comprises a hybrid line screen.

19. The image processor of claim 15 wherein the second line screen comprises a hybrid line screen.

20. The image processor of claim 13 wherein the third screen comprises a second line screen.

21. The image processor of claim 13 wherein the selected set of halftone screens are selected and oriented so that frequency vectors of the screens and a frequency vector describing a process effect combine to only produce moiré frequency vectors of types from the group consisting of zero frequency moiré frequency vectors, near zero frequency moiré frequency vectors, and high frequency moiré frequency vectors.
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22. A method of halftoning a color image that avoids two and three color moiré patterning, the method comprising the steps of:

selecting a set of screens that have fundamental frequency vectors that combine to yield only high frequency moiré frequency vectors;

5 associating a first dot screen from the selected set of screens with a first colorant;

associating a first line screen from the selected set of screens with a second colorant;

10 associating a second line screen from the selected set of screens with a third colorant;

receiving the color image to be halftoned; and,

halftoning the color image with the associated screens.

23. The method of halftoning separations of a color image of claim 22 wherein the step of associating a first line screen from the selected set of screens with a second colorant further comprises associating the first line screen with a cyan colorant.

24. The method of halftoning separations of a color image of claim 22 wherein the step of associating a second line screen from the selected set of screens with a third colorant further comprises associating the second line screen with a magenta colorant.

25. The method of halftoning separations of a color image of claim 22 wherein the step of associating a first dot screen from the selected set of screens with a first colorant further comprises associating the first line screen with a black colorant.

26. The method of halftoning a color image of claim 22 further comprising the step of: analyzing process effects wherein the step of selecting a set of screens further comprises:

selecting a set of screens that when combined with the analyzed process
5 effects, results in only high frequency moiré frequency vectors.